

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Original) A photocatalytically active coating of a substrate composed of at least two layers produced by solution chemistry and with at least one first underlayer applied to the substrate and composed of an inorganic polymer, and comprising the metal oxides  $\text{SiO}_2$  and  $\text{ZrO}_2$  covalently bonded to one another, and at least one second overlayer composed of  $\text{TiO}_2$  particles, characterized in that the underlayer comprises less than 0.5% by weight of  $\text{TiO}_2$  particles, is pore-free, and comprises  $\text{SiO}_2$  and  $\text{ZrO}_2$  in a ratio by weight of from 50:50 to 95:5.
2. (Original) The photocatalytically active coating as claimed in claim 1, characterized in that the inorganic polymer is composed of one or more metal oxides covalently bonded to one another from the group of  $\text{SiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{Nb}_2\text{O}_3$ ,  $\text{Ta}_2\text{O}_3$ ,  $\text{CaO}$ .
3. (Currently Amended) The photocatalytically active coating as claimed in claim 1 or 2, characterized in that the underlayer is composed of at least two layers applied in succession of identical or different constitution.
4. (Currently Amended) The photocatalytically active coating as claimed in ~~any of claims 1 to 3~~ claim 1, characterized in that the substrate used comprises one or more polymers selected from the group of PVC, PP, PE, PMMA, PS, PC, polyesters, epoxy materials, polyurethanes, polyisocyanates, SBR, ABS, ASA, NBR, or copolymers composed of acrylonitrile, styrene, butadiene, methacrylate, or isoprene, in each case in the form of homo- or copolymer, in the form of coextrudate, or in the form of polymer blend.
5. (Original) A process for production of photocatalytically active coatings on a substrate, characterized by the following steps of the process:
  - a. coating of a substrate with an inorganic polymer by solution chemistry via application of a suspension of the inorganic polymer or its chemical precursors in an organic suspension medium,

- b. complete or partial removal of the organic suspension medium, to give an underlayer.
  - c. application of a dispersion composed of  $\text{TiO}_2$  particles in an organic dispersion medium to the underlayer.
  - d. complete or partial removal of the organic dispersion medium to give an overlayer.
  - e. heat-treatment of the under- and overlayer at from 20 to 120°C for from 10 to 300 sec, with the proviso that the underlayer is composed of an inorganic polymer, comprises less than 0.5% of  $\text{TiO}_2$  particles, is pore-free, and comprises  $\text{SiO}_2$  and  $\text{ZrO}_2$  in a ratio by weight of from 50:50 to 95:5.
6. (Original) The process as claimed in claim 5, characterized in that the suspension used in step a) of the process comprises the metal oxides  $\text{SiO}_2$  and  $\text{ZrO}_2$ , and also optionally  $\text{Al}_2\text{O}_3$ ,  $\text{Nb}_2\text{O}_3$ ,  $\text{Ta}_2\text{O}_3$ ,  $\text{CaO}$ , and/or the corresponding alkoxides, chlorides, nitrates, hydroxides, formates, or acetates.
  7. (Currently Amended) The process as claimed in claim 5 ~~or 6~~, characterized in that the organic suspension and dispersion medium comprises ethanol, propanol, isopropanol, isobutanol, n-butanol, glycol, ethylene glycol, propylene glycol, butylene glycol, water, formic acid, and/or acetic acid, alone or in the form of a mixture.
  8. (Currently Amended) The process as claimed in claim 6 ~~or 7~~, characterized in that steps a) and b) of the process are carried out at least twice in succession.
  9. (Currently Amended) The process as claimed in ~~any of claims 6 to 8~~ claim 6, characterized in that steps c) and d) of the process are carried out at least twice in succession.
  10. (Currently Amended) A window profile, a door profile, a roller-shutter segment, a window sill, an architectural panel, a door leaf, a gutter, a downpipe, or a plastics or aluminum shell for the covering of window or door frames, with a coating as claimed in ~~any of claims 1 to 4~~ claim 1.